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Nota di contenuto	Handbook of Stimuli-Responsive Materials; Contents; Preface; List of Contributors; 1 Synthetic and Physicochemical Aspects of Advanced Stimuli-Responsive Polymers; 1.1 Introduction; 1.2 Controlled Free Radical Polymerization of Stimuli-Responsive Polymers; 1.3 Synthesis of Stimuli-Responsive Colloidal Dispersions; 1.4 Summary; References; 2 Biological- and Field-Responsive Polymers: Expanding Potential in Smart Materials; 2.1 Introduction; 2.2 Biologically Responsive Polymer Systems; 2.2.1 Glucose-Responsive Polymers; 2.2.1.1 Glucose-Responsive Systems Based on Glucose-GOx 2.2.1.2 Glucose-Responsive Systems Based on ConA2.2.1.3 Glucose-Responsive Systems Based on Boronic Acid-Diol Complexation; 2.2.2 Enzyme-Responsive Polymers; 2.2.3 Antigen-Responsive Polymers; 2.2.4 Redox-/Thiol-Responsive Polymers; 2.3 Field-Responsive Polymers; 2.3.1 Electroresponsive Polymers; 2.3.2 Magneto-responsive Polymers; 2.3.3 Ultrasound-Responsive Polymers; 2.3.4 Photoresponsive Polymers; 2.4 Conclusions; References; 3 Self-Oscillating Gels as Stimuli-Responsive Materials; 3.1 Introduction; 3.2 Methodology; 3.2.1 Continuum Equations

3.2.2 Formulation of the Gel Lattice Spring Model (gLSM)3.2.3 Model Parameters and Correspondence between Simulations and Experiments; 3.3 Results and Discussions; 3.3.1 Effect of Confinement on the Dynamics of the BZ Gels; 3.3.1.1 Linear Stability Analysis in Limiting Cases; 3.3.1.2 Oscillations Induced by the Release of Confinement; 3.3.1.3 Behavior of Partially Confined Samples; 3.3.2 Response of the BZ Gels to Nonuniform Illumination; 3.3.2.1 Modeling the Photosensitivity of the BZ Gels; 3.3.2.2 Autonomous Motion toward the Dark Region; 3.3.2.3 Light-Guided Motion along Complex Paths 3.4 Conclusions Acknowledgments; References; 4 Self-Repairing Polymeric Materials; 4.1 Introduction; 4.2 Damage and Repair Mechanisms in Polymers; 4.2.1 Dimensions of Damages and Repairs; 4.2.1.1 Angstrom-Level Repairs; 4.2.1.2 Nanometer-Level Repairs; 4.2.1.3 Micrometer-Level Repairs; 4.2.1.4 Millimeter-Level Repairs; 4.3 Summary; References; 5 Stimuli-Driven Assembly of Chromogenic Dye Molecules: a Versatile Approach for the Design of Responsive Polymers; 5.1 Introduction; 5.2 Excimer-Forming Sensor Molecules; 5.3 Fluorescent Mechanochromic Sensors; 5.4 Thermochemical Sensors 5.5 Chemical Sensing with Excimer-Forming Dyes 5.6 Summary and Outlook; Acknowledgments; References; 6 Switchable Surface Approaches; 6.1 Introduction; 6.2 Electroactive Materials; 6.2.1 High-Density and Low-Density Self-Assembled Monolayers; 6.2.2 Self-Assembled Monolayers with Hydroquinone Incorporation; 6.3 Photoresponsive Materials; 6.3.1 Molecules Containing Azobenzene Units; 6.3.2 Molecules Containing Spiropyran Units; 6.3.3 Photoresponsive Shape-Memory Polymers; 6.4 pH-Responsive Materials; 6.4.1 pH-Switchable Surfaces Based on Self-Assembled Monolayers (SAMs) 6.4.2 pH-Switchable Surfaces Based on Polymer Brushes

Sommario/riassunto

Adopting a broad approach, this volume provides the scientific community with a much-needed overview of developments and scientific findings in stimuli-responsive materials. Its primary focus is on the designing, synthesizing, formulating, and processing of materials that lead to an understanding of the scientific principles governing response driven functions leading to future technologies. The highly experienced and internationally renowned editor has assembled a team of leading scientists from the interdisciplinary areas of: * polymers* biopolymers* biochemistry* bioph
